

REMARKS

In the Office Action mailed September 17, 2003, the Examiner noted that claims 1-17 were pending, and rejected all claims. New claims 18 have been added and, thus, in view of the forgoing claims 1-18 remain pending for reconsideration which is requested. No new matter has been added. The Examiner's rejections are traversed below.

The Office Action rejects all claims under 35 U.S.C. § 103 over various combinations of Spitz, Takaoka, Yokoyama and Muir.

The present invention is designed to orient images that have been input by devices that could be considered to be manually operated such as a hand held scanner. A document scanned with such a scanner can be scanned from top to bottom or bottom to top to left to right or right to left. It is also possible for the document to be scanned in a way that creates a mirror image. As a result, the document can have one of 8 orientations. The present invention determines actual orientation of such a document and orients it to the proper or reading orientation of the document.

Conventionally, to determine the actual orientation, the document is analyzed in all of the 8 orientations. The invention improves on this.

In the invention image data set is examined to determine if contains sentences that read only in a horizontal direction. If so, the image only need be examined for data representing a document with sentences running horizontally. If not, then it only need be examined for data representing a document with sentences running vertically. This cuts down the number of analysis operations and thereby improves efficiency.

In particular, the present invention (see the independent claims) determines the actual orientation by determining the orientation of a line of text in the document. This allows the determination of whether the lines essentially run horizontally or vertically. Once the line orientation is known, the invention determines the orientation or reading direction of the text. For example, the line could be horizontal but the text upside down or backwards. The present invention extracts a line of the text and determines whether the text needs to be rotated or flipped based on the detection of the reading direction. If so the text is properly oriented or corrected to it's proper or reading orientation.

Spitz is directed to a system that determines whether the lines are horizontal or vertical and then determines whether they are skewed or warped. Spitz does not determine the reading orientation of text in addition to determining the orientation. Spitz is directed at automatically

determining text line parameters in a situation where the text is skewed from a proper orientation. Spitz is not directed at determining line and text orientation or reading direction.

Takaoka is directed at a system in which a similarity score for each of the possible orientations of a document is determined and the document is oriented based on that score. Takaoka does not teach or suggest orientation determination as is performed in the present invention.

Yokoyama adds nothing to Spitz and Takaoka relative to the way in which the present invention determines orientation. In particular, Yokoyama does not teach or suggest character recognition as alleged by the Examiner. Figure 56B, noted by the Examiner, merely depicts the possible orientations represented in the chart of figure 56A and the related text discusses how a bit based image can be reoriented when the orientations as in the chart are known.

Muir also adds nothing to the above discussed prior art concerning the way orientation is determined in the present invention. Muir is concerned with determining the language of text based on the styles of the text using point features in lines and points extracted from a document.

It is submitted that the invention of the independent claims distinguishes over the prior art and withdrawal of the rejection is requested.

The dependent claims depend from the above-discussed independent claims and are patentable over the prior art for the reasons discussed above. The dependent claims also recite additional features not taught or suggested by the prior art. For example, claim 2 emphasizes that character recognition is part of the text orientation determination. Nothing in the prior art teach or suggests this be used as in the invention discussed above. It is submitted that the dependent claims are independently patentable over the prior art.

New claim 18 emphasizes the line orientation determination, followed by the text reading orientation determination to determine actual orientation used to correct the orientation to a reading orientation. Nothing in the prior art teaches or suggests such. It is submitted that the new claim, which is different and not narrower than prior filed claims distinguishes over the prior art.

It is submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

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If any further fees, other than and except for the issue fee, are necessary with respect to this paper, the U.S.P.T.O. is requested to obtain the same from deposit account number 19-3935.

Respectfully submitted,

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Date:

1/20/4

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